SEMICONDUCTOR DEVICE WITH FULLY SELF-ALIGNED LOCAL INTERCONNECTS, AND METHOD FOR FABRICATING THE DEVICE

ABSTRACT OF THE DISCLOSURE

A semiconductor device and a method of making it involve the semiconductor device (10, 71, 101, 121, 151, 201) having a substrate (11, 73, 153) with spaced source and drain regions (13-14, 76-78, 154). A gate section (21, 81-82, 123, 203) projects upwardly from between an adjacent pair of the regions, into an insulating layer (31, 83, 103, 122, 157). In order to create local interconnects to the source and drain regions through the insulating layer, a patterned etch is carried out using an etch region (36, 87, 126), which extends over one of the gate sections from a location above one of the regions to a location above another of the regions. Etching in this etch region produces recesses (41-42, 91-93, 107-108, 138-139, 158) on opposite sides of and immediately adjacent the gate section. A conductive layer (51, 96, 111, 161, 171) is deposited to fill the recesses, and then is planarized back to the upper ends of the gate sections. The conductive material remaining in each recess is self-aligned to be immediately adjacent at least one gate section, and serves as a local interconnect for a respective source or drain region.